

# **IMPERIAL VALLEY STUDY GROUP**

## **‘STUDY ALTERNATIVES’ Summary of Findings to Date**

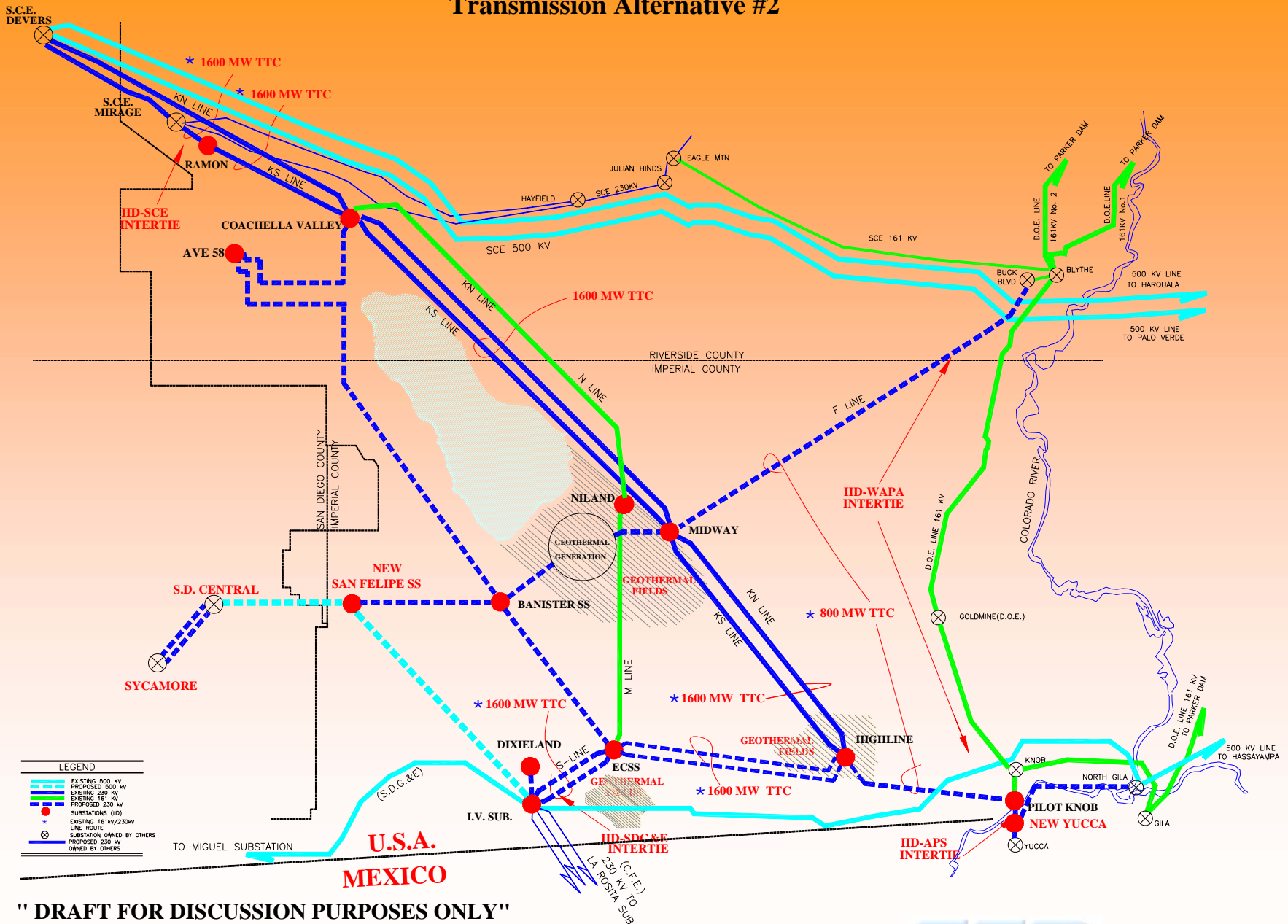
**Juan Carlos Sandoval, P.E.**

**June 30, 2005**

# Narrowed Alternatives for Additional Analysis

- **Alternative 2** (500 kV line from IV to San Diego Central, with 50% series compensation from San Felipe-Central).
- **Alternative 2a** (same as Alt 2, but with 230 kV tie to Palo Verde-Devers 1 at a new Indian Hills substation).
- **Alternative 3b** (500 kV line from IV to San Diego North, with 50% series compensation from San Felipe-North).

# Transmission Alternative #2



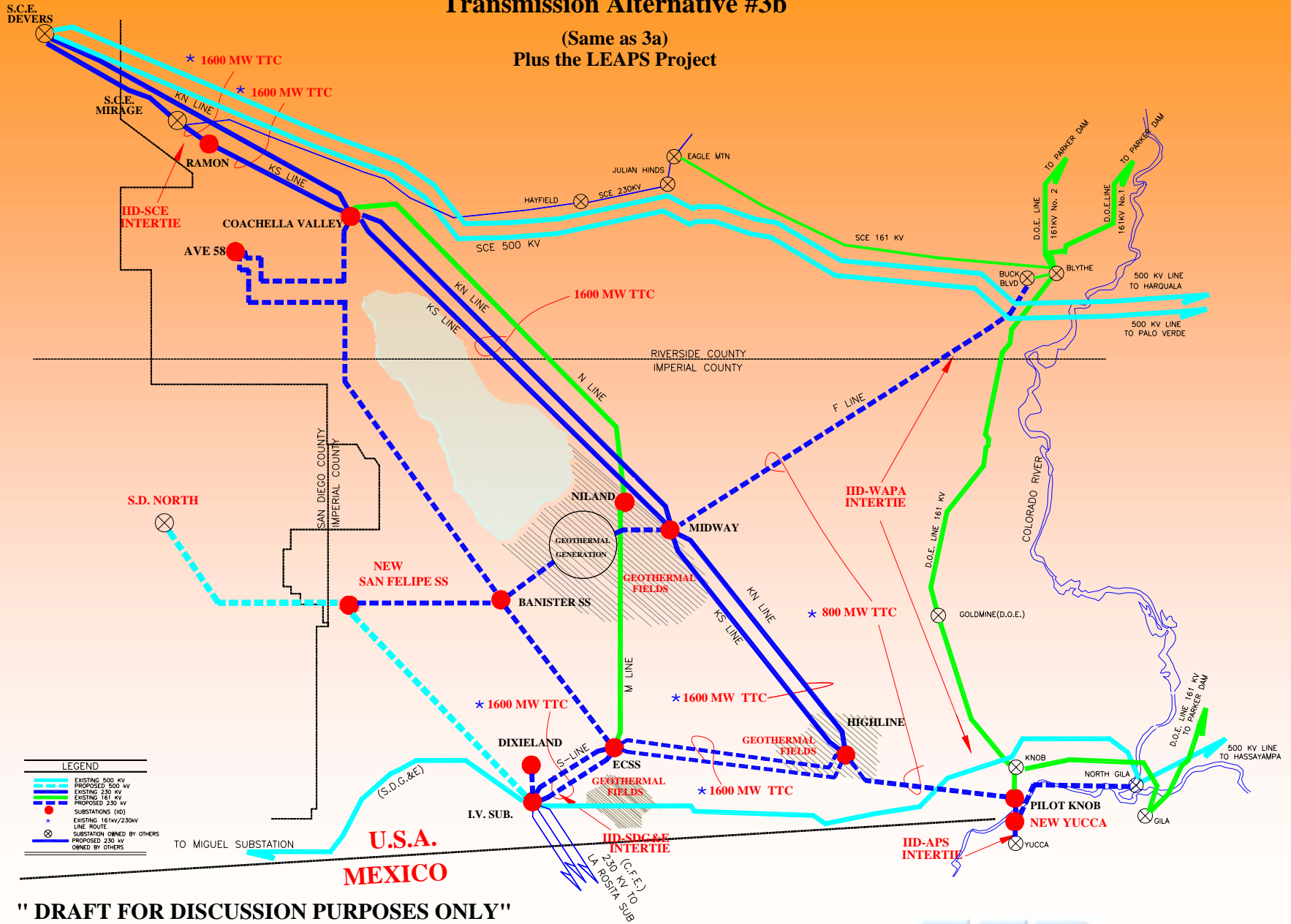
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# Transmission Alternative #3b

(Same as 3a)  
Plus the LEAPS Project



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# Thermal Analysis Summary

- IID 230kV Collector System capable of delivering an additional 2200MW of Resources
- New San Felipe and Indian Hills Substations provide for two new interconnections to the IID Collector System and delivery of new resources
- IV-Miguel and Devers-Valley 500kV critical contingencies for delivery of new resources to the southern California regional loads

# Stability Summary

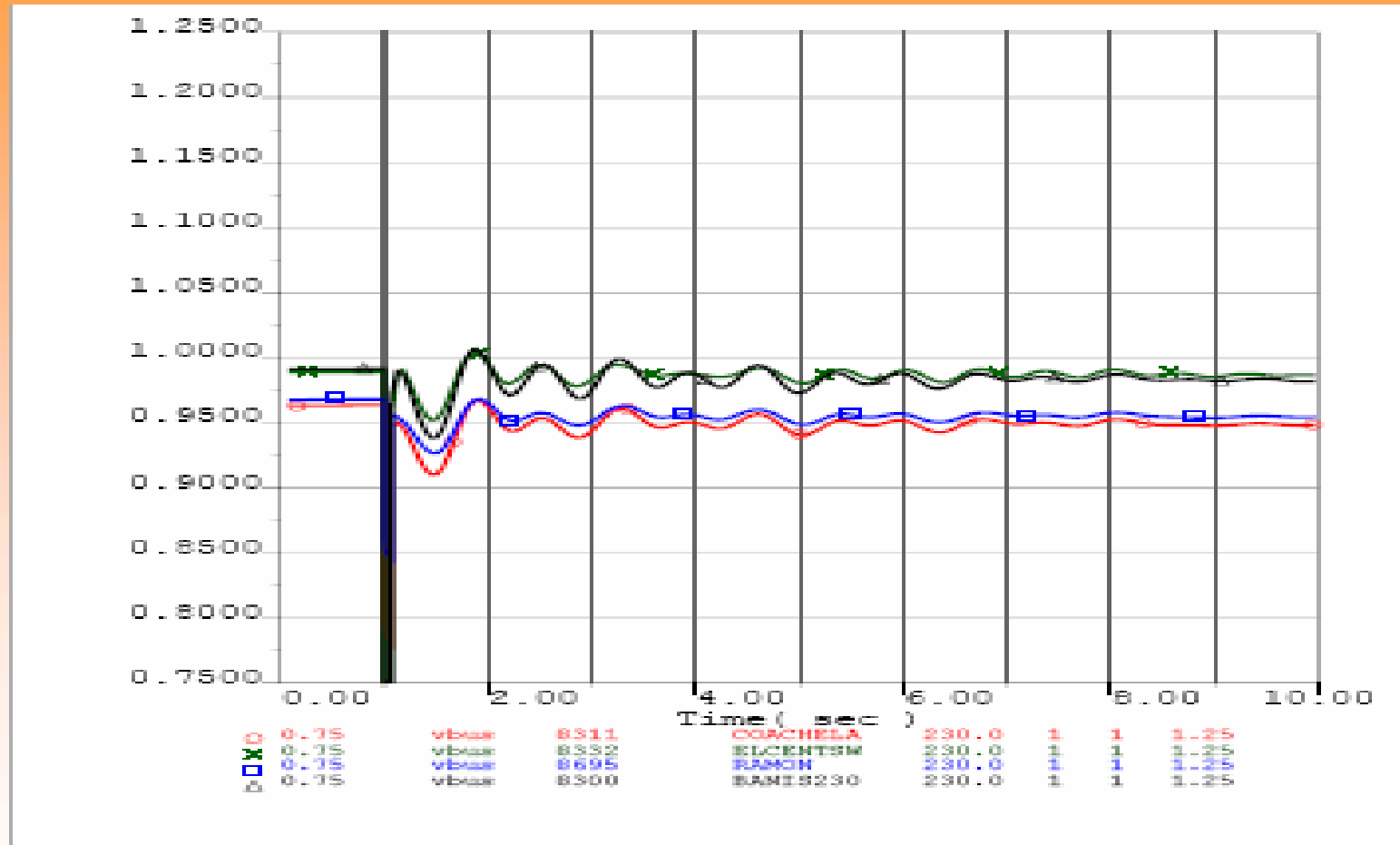
- Narrowed stability analysis to two summer alternatives and three light autumn alternatives for additional analysis
- Cases updated to reflect requirement for series compensation from San Felipe towards either Central or North SD
- Total of thirty-eight stability runs
- Need to Update Geothermal Model

	Power Flow Case and Associated Switch Decks				
Contingency	HS_ALT2_S1	HS_ALT3b_S1	LA_ALT2_S1	LA_ALT2a_S1	LA_ALT3b_S1
NERC/WECC Planning Standard - Category B (Loss of Single Element)					
IMPERIAL VALLEY-MIGUEL 500kV	lvml_noras	lvml_noras3	lahvml_noras2	lahvml_noras2a	lahvml_noras3
HASSAYAMPA-NORTH GILA 500 kV	hang	hang3	lahang2	lahang2a	lahang3
DEVERS-MIDPOINT 500kV	NA	NA	lademp2	lademp2a	lademp3
SERVAL-VALLEY 500kV	NA	seva	NA	NA	laseva3
SERRANO-SERVAL 500kV	NA	sesv3	NA	NA	lasesv3
SERRANO-VALLEY 500kV	seva1	NA	laseva2	laseva2a	NA
DEVERS-VALLEY 500kV	deva	deva3	ladeva2	ladeva2a	ladeva3
SAN FELIPE-CENTRAL/NORTH SD 500 kV	nsfc	nsfn	lansfc2	lansfc2a	lansfn3b
IMPERIAL VALLEY-SAN FELIPE 500 kV	NA	NA	lansf12	NA	lansf13b
BANNISTER-SAN FELIPE 230kV	NA	NA	lansfb2	lansfb2a	lansfb3b
NERC/WECC Planning Standard - Category C (Loss of Two or More Elements)					
COACHELLA-DEVERS/MIRAGE 230kV N-2	NA	NA	lap42_noras2	lap42_noras2a	lap42_noras3b

# Stability Findings

- All cases stable
- Lowest Transient Voltage Dip
  - Vista 230kV to 0.87 p.u. (Devers-Valley N-1)
- Lowest IID Transient Voltage Dip
  - Coachella 230kV 0.91 p.u. (IV-Miguel N-1)
- Connection to Serrano-Valley from North helps for Devers-Valley N-1

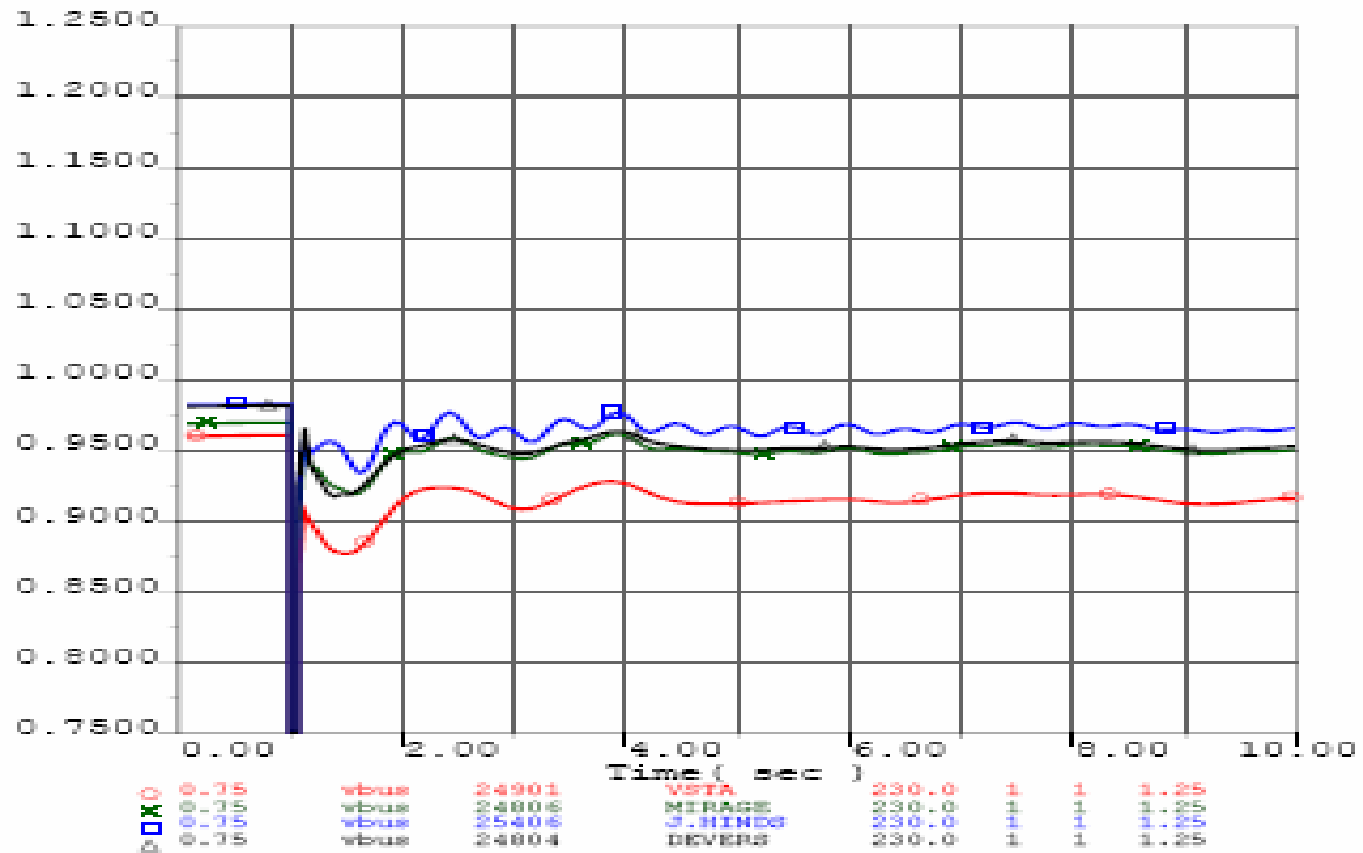
# Imperial Valley-Miguel Outage



IVSG STUDY  
 Light Autumn Case  
 Trip Imperial Valley - Miguel 500 kV No RAS  
 Case ALT 2 DISPATCH 3



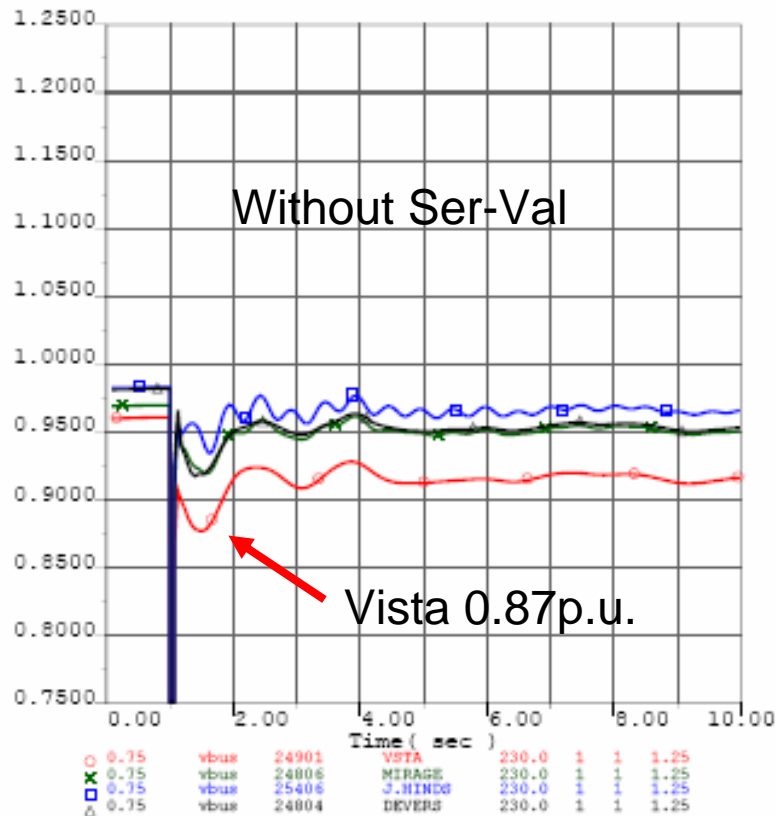
# Devers-Valley Outage



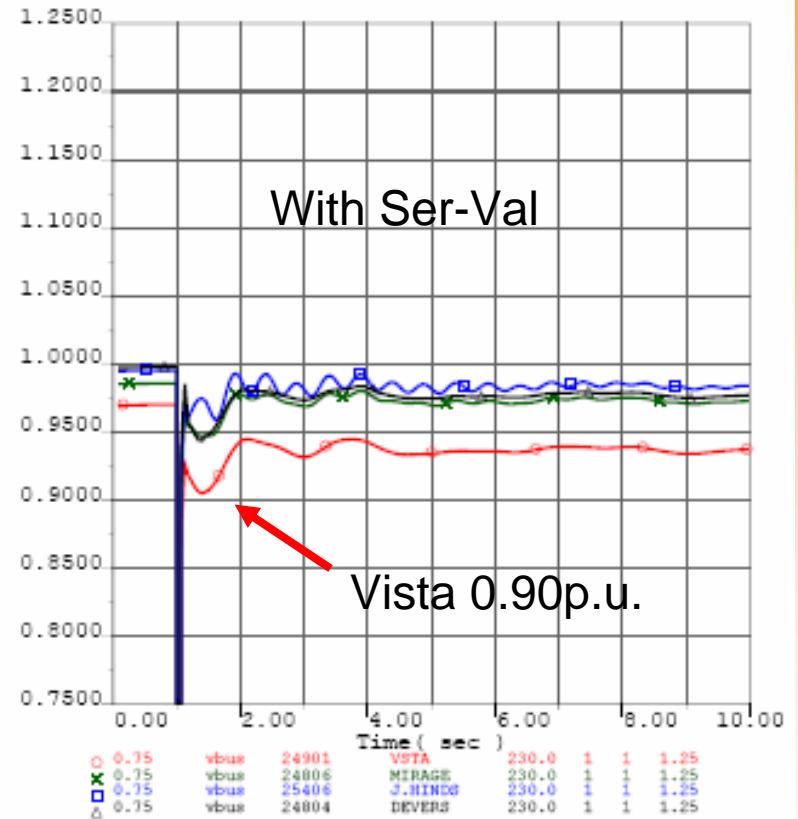
IVSG STUDY  
 Light Autumn Case  
 Trip Devers - Valley 500 kV  
 Case ALT 2 DISPATCH 3



# Comparison with SER-VAL



IVSG STUDY  
Light Autumn Case  
Trip Devers - Valley 500 kV  
Case ALT 2 DISPATCH 3



IVSG STUDY  
Light Autumn Case  
Trip Devers - Valley 500 kV  
Case ALT 3B DISPATCH 3



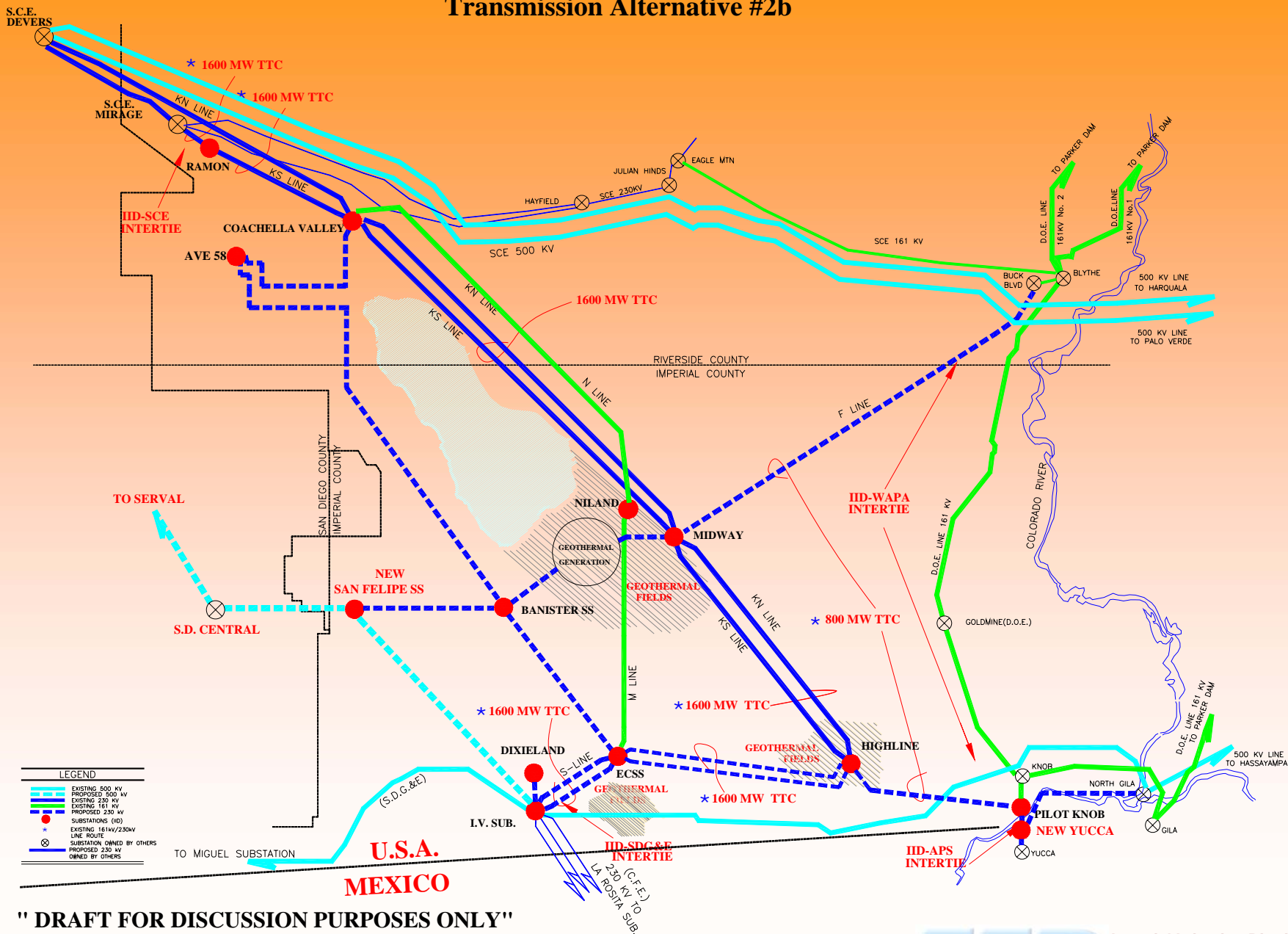
# Next Steps

- Sensitivities:
  - Higher East of the River Flow (near 9000MW)
  - Central to Serrano-Valley 500kV tie
- Refine Geothermal Models
- Finalize Report

# Central to Serrano-Valley 500kV tie Sensitivity Case

- **Alternative 2b** (same as Alt 2, but with the 500 kV line extended from SD Central to Ser-Val).

# Transmission Alternative #2b



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